EPA Comment-Response Matrix
Technical Memorandum – Anthropogenic Background Evaluation
East Waterway Operable Unit SRI/FS

- Comments received as comment bubbles in a Word document from Ravi Sanga via email on April 27, 2021. Comments are numbered in order on this table, for reference.
- Comments were discussed with EPA and EWG during a meeting on May 11, 2021. Note that EPA requested that EWG review the document to see if additional edits could be made for clarity.
- Additional EPA comments were emailed to EWG by Ravi Sanga on May 25, 2021, and added to the last row of this table.
- All EPA redlines were accepted prior to EWG editing to address comments. Redlines reflect changes from EWG only.

Comment ID No.	Page (EPA Redline Version)	Section	Text Selected for the Comment Bubble	EPA Comment	EWG Response
1.	ES-1	Executive Summary	Washington State Department of Ecology	Ecology was not a participant in the process so remove reference to WA State Dept of Ecology as an active participant with Anthropogenic Background.	Revision made per comment.
2.	ES-1	Executive Summary	%	Required global change: spell percent in text, % should only be used in tables.	Revised globally.
3.	1	1 Introduction	This	General: Check all figure and table number references and correct when necessary.	Table and figure cross-references have been checked and corrected as needed.
4.	1	1 Introduction	This	Add that this memorandum was developed under the Amended SRI/FS ASAOC and the date the amended ASAOC was signed.	ASAOC reference added.
5.	2	1.2 Problem Definition	EPA 2002a	Cite the 2002 memo not 2018. The latter is just FAQ.	Revised per comment.
6.	2	1.3 AB Estimation Approach	EPA and EWG	Elevate the role of the Tribes. They worked closely with the EPA and EWG, throughout the process. Make sure this is stated in the document.	Revised per EWG/EPA meeting discussion on May 11, 2021.
7.	2	1.3 AB Estimation Approach	Washington State Department of Ecology [Ecology],	While removing "Ecology" from the sentence. Keep the footnote about Ecology's attendance of informational meetings.	Removed "Ecology" from the sentence; retained the footnote about Ecology's attendance of informational meetings.
8.	3	1.3 AB Estimation Approach	Washington State Department of Ecology [Ecology],	Remove reference to Ecology. They did not actively participate with the small workgroup.	Removed "Ecology" from the sentence; retained the footnote about Ecology's attendance of informational meetings.
9.	4	2 Physical Conceptual Site Model	The estimated quantity of material settling in the EW is based on the "future case" estimates (FS Appendix J, Table 1, based on a site-wide average deposition rate of 1.2 cm per year	Explain if the percentages given above for the various lateral inputs are from the "future case" estimates in Appendix J of the EW FS	Text clarified; also added a footnote providing further information regarding future case.
10.	4	2 Physical Conceptual Site Model	Following remediation	Since the plan is to start remediation from the RALs, then that's part of "remediation." State that here.	Sentence deleted; comment no longer applicable.
11.	4	2 Physical Conceptual Site Model	Limitations	EPAs understanding was this "Near term" information was going to be part of a separate memo to EPA. Remove or discuss with EPA the reasons why this information needs to be in.	Per discussion with EPA, text deleted. Paragraph text revised for clarity, given the deletion.
12.	5	2 Physical Conceptual Site Model	relative timeframes for deposition of incoming solids	Not totally sure what is meant here. Do you mean "…the relative timeframes for deposition of incoming versus resuspended solids"? This paragraph requires clarification.	Sentence deleted; paragraph revised.
13.	5	2 Physical Conceptual Site Model	and recognize that initial post-construction conditions are predicted to differ from those associated with long-term equilibration to AB-based cleanup levels.	Ensure that this is consistent with EPA monitoring DQOs	Sentence deleted; paragraph revised.
14.	5	2.1 Green River Inputs	(Figure 2-3).	The reference to watershed needs to be Fig 2-4, not Fig 2-3. Make this change.	Figure and table cross-references have been checked and corrected as needed.
15.	5	2.1 Green River Inputs	(Figure 2-3).	General note – on some review versions, the figure call out numbers were incorrect. Verify all figure call outs prior to finalizing the EW AB Memo.	Figure and table cross-references have been checked and corrected as needed.

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16.	5	2.1 Green River Inputs	Dam	Not sure just "dam" is a proper noun anymore. Use the full title.	Globally revised "Dam" to "Howard Hanson Dam."
17.	6	2.1 Green River Inputs	Like Dam	Reads as though "like" is the name of a Dam. This needs to be corrected. Change "like" to similar"	Revised per comment.
18.	7	2.2 Urban Inputs	are an important component of AB	Seems a confusing to say this without also saying that because general urban sources cannot be easily separated from specific sources that are likely to be controlled through source control, laterals are not included in the EW AB calculations. Add clarifying language. It is explained later, but say this up front to avoid confusion.	Text was difficult to clarify in Section 2.2, so this clarifying text was moved to Section 3.2, where it integrates better.
19.	8	2.3 Lower Duwamish Waterway Bed Input	For the aforementioned reasons	Which reasons? Explain and clarify the "aforementioned reasons" Is it because resuspended sediments from the LDW represent inputs from a cleanup site or because it's a small fraction of the total and will eventually equilibrate to Green River conditions? Clarify.	Revised for clarity.
20.	8	2.3 Lower Duwamish Waterway Bed Input	LDW bed load is not included in the AB evaluation	Include more justification for why LDW bedload was not included. Will the relative contaminant contribution change as sources are controlled? This needs to be explained.	Additional justification added.
21.	9	3 Screening of Potentially Applicable Datasets	Frequently Asked Questions About the Development and Use of Background Concentrations at Superfund Sites: Part One, General Concepts (EPA 2018),	This needs to really reference the 2002 Role of Background (April) and the subsequent Sept guidance. The 2018 FAQ was not allowed to present new material. Correct this reference.	Reference revised.
22.	9	3 Screening of Potentially Applicable Datasets	e.g., laboratory samples to assess accuracy and precision	Confusing statement. Is this referring to laboratory control samples, of the over QC process? Clarify.	Clarified per comment.
23.	10	3.1.1 Green River Investigations	U.S. Army Corps of Engineers (USACE) – Turning Basin Sediment Core Sampling (Summarized in Windward 2020): bedded sediment Lower Duwamish Waterway Group (LDWG) – Compilation of Existing Data Report (Windward 2018), LDW Pre-Design Studies Data Evaluation Report (Windward 2020): surface water and bedded sediment	Include more information explaining why these highlighted are considered to be Green River investigations when they are located in the LDW.	Text added to the last bullet and in the last paragraph of the section to address this comment.
24.	12	3.1.2.1 Suspended Solids Datasets	For geographical representativeness	Explain that representativeness here refers to sources of contamination that may enter the EW from the upstream areas rather than being located in a representative environment/habitat (e.g. freshwater v marine).	Footnote added to clarify.
25.	12	3.1.2.2 Surface Water Datasets	considered representative when compared to suspended solids data for estimating solids concentrations	Rewrite to clarify or just delete this highlighted section	Deleted most of selected text; retained "considered representative" text so that sentence was complete.
26.	13	3.1.2.2 Surface Water Datasets	;	Break the sentence here so it isn't the whole paragraph.	Revised per comment.
27.	14	3.2 Urban Input Data	However, while a number of source control actions have occurred, additional source control will occur in the future to ensure sources are sufficiently controlled to proceed with sediment cleanup actions	Delete the first sentence of the last paragraph in this section, as the degree to which source-control actions are in place at the LDW SF site aren't relevant to the calculation of EW anthropogenic background.	Per EPA discussion on May 11, 2021, referenced text was deleted but paragraph modified to address comment 18.
28.	18	4.3.1 Congener Selection	Therefore, these four congeners were selected for the development of AB values for use in establishing cleanup levels associated with seafood consumption pathway. These four congeners are as follows:	Explain why background wasn't calculated for all 17 dioxin congeners.	As discussed with EPA on May 11, 2021, no change is needed based on this comment; the text indirectly covers this topic by explaining why four congeners were selected. Per discussions with EPA, the order of text in this section has been revised and modified for clarity.

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29.	19	4.3.2 Non-Detect Treatment	Because a statistical treatment is often preferred for this type of analysis	Add a reference or basis for the preference of the type of statictics. They're all "statistical" methods. What is needed here is a discussion of why a different method of treating NDs was used here rather than maintaining consistency with the method used for PCBs given that the results for all methods were similar. Our recommendation was to use 0 for NDs, consistent with what was done for PCBs. ROS may add more detail and clarify. Also discuss using 0 for non detects.	Revised based on discussion with EPA on May 11, 2021. EPA clarified the comment was not directing a change in the treatment of NDs for the four dioxin/furan congeners. Text revised and clarification added to footnote.
30.	19	4.4 Arsenic	EPA 200.8/6020, 3050B/6020A, and 3050B/200.8	This is somewhat confusing and requires clarification, 200.8 is a drinking water method, 6200 is a SW846 method for solid matrices (soil/sediment), both use ICP-MS for the analysis. 3050 is an acid extraction, not an analysis. Be clear and state what matrices were analyzed, as it's not clear why an acid extraction from sediment was apparently subsequently analyzed using a DW method.	Reviewed source data and the database and revised for accuracy. 3050B should not have been listed. 200.8 is listed for Ecology 2009 samples and the first two rounds of USGS data in the EIM database.
31.	20	4.4 Arsenic	The influence these	Explain if part of the reason for not adjusting the Green River AB value for biogeochemical processes is that we don't know the extent of those processes following EW cleanup.	Yes. Explanation added. Note that during revisions, paragraph two in the revised document was moved up from below, to improve flow of text.
32.	21	4.5.1 Conceptual Site Model Outlier Evaluation	significant	Explain what defines "significant".	Revised based on discussion with EPA on May 11, 2021.
33.	21	4.6 Particle Size Distribution in Suspended Sediment	contamination	Explain if its, more contamination or higher concentrations relative to larger particles.	Clarification added to text.
34.	22	4.6 Particle Size Distribution in Suspended Sediment	fine-grained sediments (Figure 2-3; QEA 2008).	Provide the range of %fines in the EW bedded sediment. Also, this information needs to be added to the CSM section up front.	Comment not incorporated. Percent fines varies depending on proximity to outfalls as well as propwash from ships, and the Phase 1 removal action contains a sand cover layer, so the range of percent fines (1% to 92%) would not provide useful information for AB determinations.
35.	23	4.6.3 Particle Surface Area Adjustments	A third method was developed to adjust concentrations based on trends in contaminant concentrations associated with various particle size fractions. This adjustment accounts for the relative mass size distribution between the Green River and the EW, and considers the fact that the area available for contaminant binding to a particle is proportional to the surface area of that particle (Hedges and Kiel 1995; Karickhoff et al. 1979; Wang and Keller 2008). As particle size increases, the relative mass (which is directly proportional to the volume of the particle) increases at a faster rate relative to the increase in surface area. This calculation is provided in Appendix B, Part 2 of this document.	This paragraph was difficult to understand. Tried to rephrase. Not sure it's accurate. This section was rewritten by EPA because pertinent information was missing. More discussion may be needed with EPA.	Text accepted with minor modifications for accuracy and clarity (e.g., added reference to "organic" contaminants).
36.	23	4.6.3 Particle Surface Area Adjustments	mass size	Is "mass size" correct? Change and correct if needed.	Should be "particle size." Revised.
37.	24	4.6.4 Summary of Particle Size Distribution Adjustments for Organic Contaminants	Selected with EPA	Earlier sections word this a bit differently, "EPA selected" – needs to be consistent. A small detail, but it conveys the process and the decisions making authority that was followed.	Text was deleted by EPA.

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38.	24	4.6.4 Summary of Particle Size Distribution Adjustments for Organic Contaminants	Therefore, fines normalization method was selected for the AB estimate for PCBs and dioxins/furans.	Explain why arsenic was not adjusted.	Added statement at beginning of Section 4.6 regarding this relationship not applying to metals.
39.	27	5.4 Green River Flow and Precipitation Conditions	with Green River bed material	May not necessarily be GR bedded material, but input from feeder streams. Add more detail and explanation here whether is GR or feeder streams that are influencing.	Comment applies to EPA text edit. The arsenic data from the Green River and feeder streams are variable and therefore challenging to make inferences about; recommend no additional changes.
40.	28	5.5 Future Urban Inputs	General	Explain "Diffuse" inputs.	Explanation added.
41.	28	5.5 Future Urban Inputs	will occur prior to the LDW and EW cleanups	It's not clear this statement is true. Add more justification or delete. This paragraph needs to be re-written. Not sure what the main point is.	Edited for clarity. The first sentence of the section describes that diffuse sources will be ongoing after source control.
42.	29	5.8 Lower Duwamish Waterway Bedded Sediment	The impact of omitting the contribution of resuspended LDW bedded sediment to AB is small for a couple of reasons. First, current modeling indicates that sediment load to the EW from LDW bed is minimal (0.24% of the total load; Figure 2-2) . Second, in the long term, LDW bedded sediment concentrations following completion of the CERCLA cleanup are expected to equilibrate with incoming concentrations from the Green River and urban inputs from LDW lateral inputs. Following remediation of LDW, monitoring data will be available to better understand LDW site-wide concentrations.	Add that most importantly, resuspended LDW bedded sediment is not considered background.	Text modified per comment.
43.	30	6 Summary and Conclusions	The UCL95 on the mean will be used in future EW decision documents in place of the natural background-based PRG values presented in the EW FS. Mean, median, and two upper tolerance limits (90/90 UTL and 95/95 UTL) are also presented in the table for informational purposes. Post-remediation sediment monitoring is expected to include comparison of mean bedded sediment concentrations to the UCL95-based cleanup levels to assess post-remediation site performance.	This is probably true, but is premature to say here. And not needed, the entire purpose of this document is to document the derivation of the background values. Remove this paragraph.	Per discussion with EPA, removed description of how future monitoring could operate. The remaining text was retained to explain the summary statistic used for listed AB values and the other summary statistics presented in the table.

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44.	n/a	Email Comment	n/a	Ravi Sanga email, May 25, 2021: Dan and Brick – Please see below for EPAs remaining comments on the Draft East Waterway Anthropogenic Background Memo. These comments are based on review and comment by the Suquamish Tribe. **General Comment** The Document needs to clearly state that the East Waterway AB values are site-specific for the EW site and are not appropriate for use at other sites or as precedent for replacing natural background values. In order to address this comment, include text in the executive summary and introduction sections indicating that these are site-specific AB values for the EW Site. Edit the first sentence in the Executive Summary as follows: "This memorandum develops site-specific anthropogenic background (AB) estimates for total polychlorinated biphenyls (PCBs), dioxins/furans, and arsenic for the East Waterway (EW) sediment Operable Unit of the Harbor Island Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund site located in Seattle, Washington." Insert "site-specific" before "anthropogenic background" in the first sentence of the first paragraph of Section 1. Insert the following sentence at the end of the first paragraph of the first paragraph of Section 1. "The East Waterway AB values are site-specific for the EW site and are not appropriate for use at other sites." **Section 2, Page 3:** Remove quotation marks on the word future case and define the term as it is used here. **Section 4.8, Page 24:** Include decisions made regarding arsenic in the list of selected data treatments. **Section 5:** The uncertainty/sensitivity discussion must look at all the decisions made related to the treatment of data, as summarized in Section 4.8 (with the inclusion of arsenic). Include discussions for uncertainty/sensitivity introduced by decisions made regarding non-detects for PCBs and dioxin/furans. Include discussions related to the potential implications of including more D/F congeners than only the four D/F congeners most closely associated with risk.	**General Comment:** Revisions made verbatim per EPA comments. **Section 2, Page 3:** Revisions made per EPA comments. Also see comment 9 response, above. **Section 4.8, Page 24:** Revisions made per EPA comments **Section 5:** Revisions made to Section 5. New sections (Sections 5.3 and 5.4) added for non-detect treatment and dioxins/furans. Section 5.8 (Arsenic Post-Depositional Processes) revised to further address arsenic.

Notes:
ASAOC: Administrative Settlement Agreement and Order on Consent
Ecology: Washington State Department of Ecology
EIM: Environmental Information Management
EPA: U.S. Environmental Protection Agency
EWG: East Waterway Group
USGS: U.S. Geological Survey